

1. For the scenario below, use the model for the volume of a cylinder as $V = \pi r^2 h$.

Pringles wants to add 26 percent more chips to their cylinder cans and minimize the design change of their cans. They've decided that the best way to minimize the design change is to increase the radius and height by the same percentage. What should this increase be?

- A. About 8 percent
 - B. About 3 percent
 - C. About 12 percent
 - D. About 13 percent
 - E. None of the above
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2. For the scenario below, use the model for the volume of a cylinder as $V = \pi r^2 h$.

Pringles wants to add 38 percent more chips to their cylinder cans and minimize the design change of their cans. They've decided that the best way to minimize the design change is to increase the radius and height by the same percentage. What should this increase be?

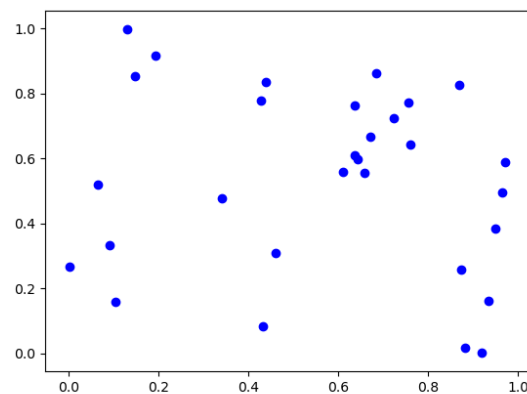
- A. About 19 percent
 - B. About 3 percent
 - C. About 11 percent
 - D. About 17 percent
 - E. None of the above
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3. Solve the modeling problem below, if possible.

A new virus is spreading throughout the world. There were initially 6 many cases reported, but the number of confirmed cases has doubled every 2 days. How long will it be until there are at least 1000 confirmed cases?

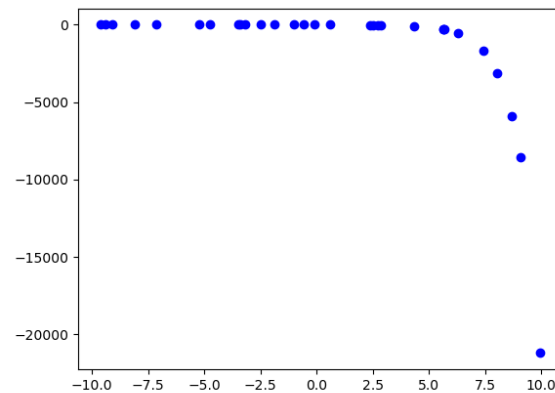
- A. About 15 days
 - B. About 6 days
 - C. About 11 days
 - D. About 5 days
 - E. There is not enough information to solve the problem.
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4. Determine the appropriate model for the graph of points below.



- A. Logarithmic model
 - B. Non-linear Power model
 - C. Linear model
 - D. Exponential model
 - E. None of the above
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5. Determine the appropriate model for the graph of points below.



- A. Linear model
- B. Non-linear Power model
- C. Logarithmic model
- D. Exponential model
- E. None of the above

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6. For the scenario below, model the rate of vibration (cm/s) of the string in terms of the length of the string. Then determine the variation constant k of the model (if possible). The constant should be in terms of cm and s.

The rate of vibration of a string under constant tension varies based on the type of string and the length of the string. The rate of vibration of string ω decreases as the quartic length of the string increases. For example, when string ω is 4 mm long, the rate of vibration is 29 cm/s.

- A. $k = 1132.81$
- B. $k = 0.74$
- C. $k = 7424.00$
- D. $k = 0.11$
- E. None of the above.

7. Solve the modeling problem below, if possible.

In CHM2045L, Brittany created a 25 liter 34 percent solution of chemical χ using two different solution percentages of chemical χ . When she went to write her lab report, she realized she forgot to write the amount of each solution she used! If she remembers she used 15 percent and 45 percent solutions, what was the amount she used of the 15 percent solution?

- A. 11.27liters
- B. 12.50liters
- C. 9.17liters
- D. 15.83liters
- E. There is not enough information to solve the problem.

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8. Solve the modeling problem below, if possible.

A new virus is spreading throughout the world. There were initially 4 many cases reported, but the number of confirmed cases has quadrupled every 2 days. How long will it be until there are at least 1000000 confirmed cases?

- A. About 18 days
- B. About 12 days
- C. About 10 days
- D. About 25 days
- E. There is not enough information to solve the problem.

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9. Solve the modeling problem below, if possible.

In CHM2045L, Brittany created a 15 liter 9 percent solution of chemical χ using two different solution percentages of chemical χ . When she went to write her lab report, she realized she forgot to write the amount of each solution she used! If she remembers she used 7

percent and 28 percent solutions, what was the amount she used of the 28 percent solution?

- A. *2.11liters*
- B. *13.57liters*
- C. *1.43liters*
- D. *7.50liters*
- E. There is not enough information to solve the problem.

10.
